Six New Diplopods of the Family Xystodesmidae.*

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The purpose of this paper is to describe new species of diplopods of the Family Xystodesmidae Cook 1904 occurring in North Carolina, Kentucky, and Tennessee. The holotypes are in the collection of the Academy of Natural Sciences of Philadelphia, and allotypes and paratypes are in the author's personal collection.

DELTOTARIA new genus.

Genotype: *D. brimleii* new species.

This genus resembles *Apheloria* in the curvature and the length of the principal blade of the telopodite of the male gonopods, but differs in having a thin subterminal process on the blade. It differs from other genera of this family in that the gonopods bear a large medial pointed coxal peg in addition to the characteristic sickle-like coxal spine.

Deltotaria brimleii new species (Figs. 1, 2).

Color in life unknown; dorsum, head, and antennae of dried specimens brown; keels, posterior margins of tergites, and margins of collum faded red-orange; legs and under parts pale yellow.

Repugnatorial pores on upper margin of posterior third of keels. Dorsum more arched than is usual in this family. Coxae posterior to gonopods spined. Sternites unarmed. Body parallel-sided over middle portion, gradually narrowed anteriorly, abruptly narrowed posteriorly.

In situ main blades of gonopods subparallel and perpendicular to longitudinal axis of body. Flattened apical third of main blade bent cephalad, ending in a thin subapical process and an attenuated apical hook (Fig. 1). Basal medial portion of blade thickly setose and proximal third sparsely setose. A large pointed peg on medial side of coxa and adjacent to the curved coxal spine of the gonopod (Fig. 2).

Length of male holotype, 31 mm.; width, 8.2 mm. Length of female allotype, 32 mm.; width, 29.3 mm.

Type.— ♂ Swannanoa, North Carolina; May 26, 1923 (Dr. C. S. Brimley). *Allotype.*—1 ♀; same data.

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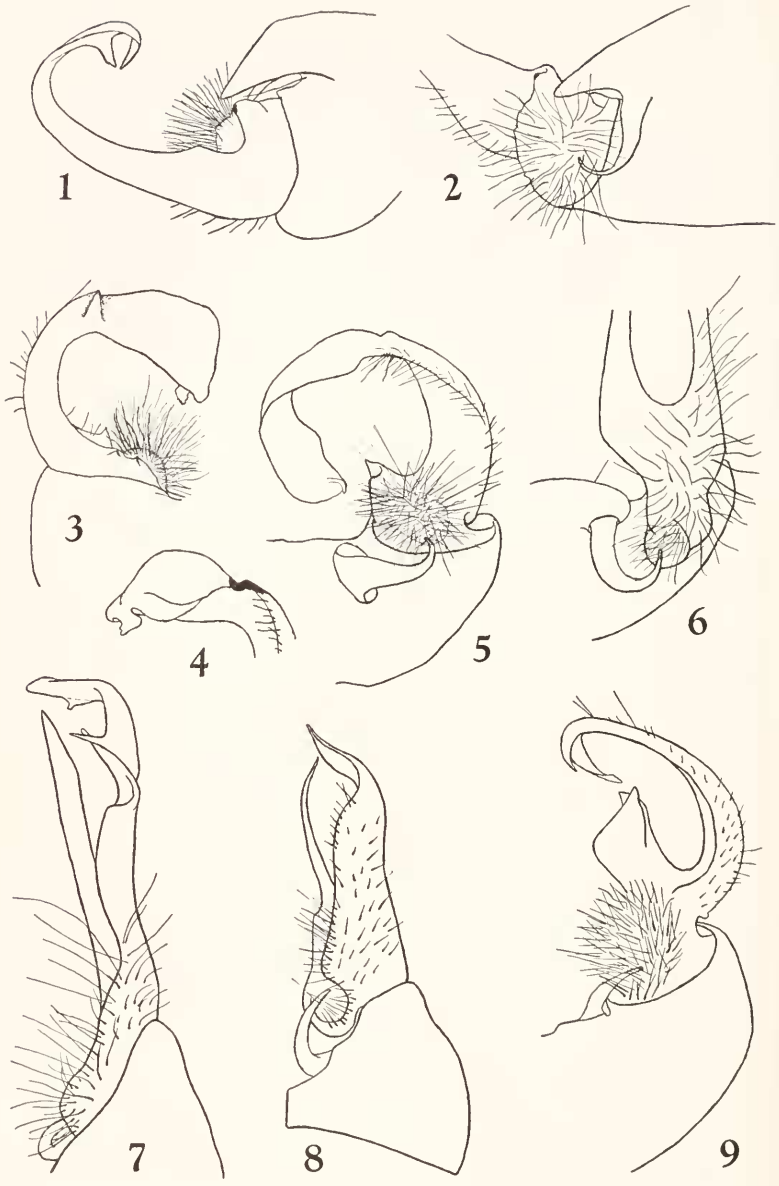
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Fontaria kentuckiana new species (Figs. 3, 4).

The general appearance of the gonopods *in situ* is similar to that shown by Gray for *virginiensis,* the type species of this genus; but in detail the gonopods are quite unlike the figure given by Williams and Hefner (1928) for *virginiensis.* The color of *virginiensis* was given by Gray as pale yellow; in *kentuckiana* the dorsum is shining dark brown; head and antennae brown; ends of collum, posterior angles of keels, roughly triangular areas on tergites or borders of tergites and collum red-orange; distal half of legs red-orange; under parts and proximal half of legs pale yellow. In alcohol dorsum fades to brown and keels and legs to yellow.

Repugnatorial pores on upper margin of posterior half of keels. Dorsum moderately arched. Body parallel-sided, gradually narrowed anteriorly, abruptly narrowed posteriorly. Anterior of female narrower than that of male. Coxae posterior to gonopods spined. Sternites unarmed. Six anterior pairs of legs of male shorter, thicker, and more setose than those of female.

Main blade of gonopod curves anterio-medially, crosses that of other gonopod, and ends in a large clavate structure that bears an inconspicuous curved apical process (Figs. 3, 4); proximal to clavate structure is a transverse ridge of chitin; telopodite densely setose at base and sparsely setose on caudal margin of blade from base to chitinous ridge; three small dentate processes on base of telopodite.

Length of male holotype, 47.5 mm.; width, 11.7 mm. Length of female allotype, 52 mm.; width, 12.4 mm.

Type.—♂; Cumberland Falls State Park, KENTUCKY; June 16, 1940. *Allotype.*—♀; same data. *Paratypes.*—1 ♂, 6 ♀, and several larvae of sixth and seventh stadia; same data.

Cleptoria splendida new species (Fig. 5).

Distinguishable from *macra* in having a medial row of bright yellow spots on the tergites. The main blade of the male gonopod is more regularly curved than in *macra* and the ter-

Explanation of Figures

Fig. 1. *Deltotaria brimleii,* right gonopod, subcephalad view (x 30).
Fig. 2. *Deltotaria brimleii,* right gonopod, caudo-medial view (x 30).
Fig. 3. *Fontaria kentuckiana,* right gonopod, subcephalad view (x 15).
Fig. 4. *Fontaria kentuckiana,* right gonopod, subcaudal view (x 15).
Fig. 5. *Cleptoria splendida,* left gonopod, medial view (x 15).
Fig. 6. *Nannaria scutellaria,* left gonopod, ventral view (x 30).
Fig. 7. *Nannaria scutellaria,* left gonopod, submedial view (x 30).
Fig. 8. *Aporiaria deturkiana,* left gonopod, subventral view (x 30).
Fig. 9. *Apheloria bidens,* left gonopod, submedial view (x 15).

minal part is less beak-like.

Dorsum, head, and antennae black; tergites trimaculate, all spots bright yellow; spots on latero-posterior corners of keels and ends of collum triangular; medial spots on tergites triangular to trapezoidal; medial spots on collum hourglass-shaped; legs yellow; underparts pale yellow.

Repugnatorial pores on posterior third of upper surface of margin of keels. Dorsum moderately arched. Coxae posterior to gonopods spined. Sternites of seventh to seventeenth segments bluntly spined. Body parallel-sided over middle portion, abruptly narrowed anteriorly, and gradually narrowed posteriorly. Six anterior pairs of legs shorter and thicker than any others.

Main blade of gonopod curves meso-cephalad, crosses blade of opposite gonopod, curves dorsad, and then caudad, almost forming a complete ellipse. About midway of the wide flattened blade there is a transverse furrow beyond which the blade is wider. A sharp peg arises from the large base on the cephalad surface of the telopodite (Fig. 5).

Length of male holotype, 49 mm.; width, 11 mm.

Type.— ♂ ; Pine Mountain State Park, KENTUCKY; June 16, 1940.

Nannaria scutellaria new species (Figs. 6, 7).

Similar in size and coloring to *tennesseensis.* In *scutellaria* there is a definite terminal geniculation in the principal blade of the gonopod, while in *tennesseensis* this blade is "somewhat flattened and wavy, end slightly expanded." The shorter branch of the telopodite in both species is twisted near the base.

Dorsum dark brown; head and antennae light brown; keels red; legs and underparts pale yellow.

Repugnatorial pores on posterior third of margin of keels. Dorsum moderately arched. Sternite of fifth body segment of male bears a pair of conical processes between bases of fourth pair of walking legs. Sternites posterior to gonopods spined. Coxae unarmed. Shield-like sternite of third body somite of female compressed subvertically. Small nipple-like area near each gonopod of female. Setae on three proximal joints of legs continued across sternites in male but not in female. Body parallel-sided over middle portion, gradually narrowed anteriorly and posteriorly; anterior of female narrower than that of male.

Blades and processes of telopodites of gonopods subparallel with main axis of body. Main blade sharply bent so that its apex is but slightly anterior to apex of straight process (Fig. 7); proximal to the bend there is a constriction and a deflection

of part of blade as two minute appressed spines directed medially; small tooth proximal to truncated apex.

Length of male holotype, 24 mm.; width, 4.2 mm. Length of female allotype, 26.4 mm.; width, 5 mm.

Type.—♂ ; Great Smoky Mountains National Park, near Chimneys, TENNESSEE; June 21, 1940. *Allotype.*—♀ ; same data.

Aporiaria deturkiana new species (Fig. 8).

Similar to *geniculata* in coloring. Gonopods similar to those of *carolina*. Can be distinguished from both *geniculata* and *carolina* by presence of spines on coxae posterior to gonopods.

Dorsum shining black with a green tinge; orange triangle on posterior corners of keels and ends of collum; thin orange line around collum and on posterior margins of most tergites; legs, underparts, and antennae pale yellow. In alcohol dorsum fades to brown and keels to pale yellow.

Repugnatorial pores on posterior third of upper margin of keels. Keels inconspicuous. Body parallel-sided over middle portion, gradually narrowed anteriorly, abruptly narrowed posteriorly. Dorsum more arched than is usual in this family. Coxae posterior to gonopods spined. Sternites unarmed.

Blades and processes of telopodites of gonopods subparallel with main axis of body. Thin apical portion of main blade curves mesad and ends in an acute point (Fig. 8). Apex of coxal spine lies in a cup-like pit on mesal surface of main blade. Coxae of gonopods closely appressed medially.

Length of male holotype, 32.5 mm.; width, 6.3 mm. Length of female allotype, 36.3 mm.; width, 7.8 mm.

Type.—♂ ; Highlands, NORTH CAROLINA; June 14, 1940 (Dr. William DeTurk). *Allotype.*—♀ ; same data. *Paratype.*—1 ♂ ; same data. *Other localities.*—Several males and gravid females, Great Smoky Mountains National Park, near Clingman's Dome, TENNESSEE; June 23, 1940; the length of the males was about 25 mm., and the gravid females were as long as 40 mm. Several larval and adult females; same data, but near Alum Cave.

Apheloria bidens new species (Fig. 9).

General appearance of male gonopods resembles *aspila*, but *bidens* can be distinguished by the larger basal process and the small subapical process of the main blade of the telopodite.

Dorsum dark brown; head and antennae lighter brown; lateral portions of keels and ends of collum bright red; distal

half of legs red; under parts and proximal half of legs pale yellow.

Repugnatorial pores on posterior third of upper edge of keels. Dorsum more arched than usual in this family. Sternites unarmed. Coxae posterior to gonopods spined. Body parallel-sided over middle portion, abruptly narrowed anteriorly, gradually narrowed posteriorly.

Gonopods especially distinct in the large bluntly furcate basal process and the small lateral subapical process of the main blade of the telopodite (Fig. 9).

Length of male holotype, 43 mm.; width, 9.1 mm. Length of female allotype, 44.6 mm.; width, 10.7 mm.

Type.—♂; Great Smoky Mountains National Park, near Chimneys, TENNESSEE; June 21, 1940. *Allotype.*—♀; same data. *Paratypes.*—3 ♀; same data.

Again: Why does Gyrinus Circle? (Coleoptera; Gyrinidae).

Abbott's stimulating paper, "Why Does Gyrinus Circle?" in *Entomological News*, Vol. LII, No. 10, December, 1941, pp. 287-290, describes how Gyrinidae perceive minute vibrations at the water's surface and are thereby led to the discovery of wounded prey. The vibration-perceptors are located in the antennae and are sensitive to vibrations within a radius of three or four centimeters.

No criticism of a minor point in Abbott's paper should be allowed to draw credit from the ingenious experiments by which the above physiological facts were discovered. It may be pointed out however, that the demonstration of vibration-perceptors in the antennae still fails to explain why *Gyrinus* circles. At the close of his paper Abbott states:

"By *circling, Gyrinus* greatly increases the area of surface which it covers in a given time, and hence, naturally increases its *chances* of encountering vibrations set up on the surface of the water."

Not only is such a conclusion unrelated to the experimental evidence presented by Abbott, but it is also mathematically untrue. If the insect moved forward in a straight line, it would cover a greater surface in a given time than it would by circling, for each time it crossed a point where it had already been, it would cover a portion of territory already found sterile. Thus its intersections of an old track would *reduce* the "chances of encountering vibrations set up on the surface of the water."

I return the question to further consideration by scientists.—C. BROOKE WORTH, Edward Martin Biological Laboratory, Swarthmore College, Swarthmore, Pennsylvania.